

providing a reactor chamber with an interior space and a reactor wall having a first side formed with inlet openings communicating with the interior space and a second side;

mounting a substrate having a surface at the second side of the reaction wall in the interior space of the reactor chamber;

providing a distributor plate in the interior space of the reactor chamber;

setting a distance between the distributor plate and the substrate of less than 2 cm;

performing chemical vapor deposition by introducing into the interior space starting gases containing elements of a solid-state layer to be deposited on the surface of the substrate and at least one auxiliary substance through the inlet openings;

providing the auxiliary substance in a form containing molecules having a dipole moment and a property of briefly attaching themselves, during a deposition process, to the surface of the substrate with a dipole moment perpendicular to the surface of the substrate in order to dictate a crystal structure of the solid-state layer;

providing the reactor chamber with a gas outlet; and

pumping away reaction products through the gas outlet.

Claim 2(amended). The method according to claim 1, wherein the step of introducing the auxiliary substance includes feeding the auxiliary substance into the interior space from an external supply source.

Claim 4(amended). The method according to claim 1, which comprises:

providing the auxiliary substance substantially from reaction products being pumped away from the interior space during the chemical vapor deposition.

Claim 6(amended). The method according to claim 5, which comprises providing the solid-state layer with a Perovskite structure.

Claim 7(amended). The method according to claim 1, which comprises:

setting the distance between the distributor plate and the substrate preferably at approximately 1 cm.

Claim 8(amended). The method according to claim 1, which comprises providing the distributor plate as a perforated plate.

Claim 9(amended). The method according to claim 1, which comprises introducing a carrier gas through the inlet openings.

Claim 10(amended). The method according to claim 1, which comprises:

providing the reactor chamber with a further gas outlet opening formed in the reactor wall downstream of the substrate; and

providing a connecting line connecting the gas outlet opening to one of the inlet openings located downstream of the distributor plate.